Test Report
Aggregate Gradation

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Lab No.	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Test Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	IS : 2386 (Part - 1) 1963 & Specification for Road & Bridge Works, MORT&H, Rev. V.
Location	Hot Mix Plant
Material	Coarse Aggregates
Sample No	1
Date	12-Jun-2018

Weight of Sample: 4000 gms

Sl. No.	I.S. Sieve size (mm)	Weight Retained (gm)	Percentage of weight Retained (%)	Cumulative Percentage of weight retained	Cumulative % of Passing		Remarks
					Test Result	Gradation Limits as per MORT&H	
1	19.00	0	0.00	0.00	100.00	100	Gradation satisfies the MORT&H Grade ll Specification for Bituminous Concrete
2	13.20	674	16.85	16.85	83.15	72-100	
3	9.50	432	10.80	27.65	72.35	70-88	
4	4.75	236	5.90	33.55	66.45	53-71	
5	2.36	477	11.93	45.48	54.53	42-58	
6	1.18	340	8.50	53.98	46.03	34-48	
7	0.60	438	10.95	64.93	35.08	26-38	
8	0.30	430	10.75	75.68	24.33	18-28	
9	0.15	378	9.45	85.13	14.88	12-20)	
10	0.075	360	9.00	94.13	5.88	(4-10)	

Note:

i. The results indicated above are based on the tests carried out on the sample at site.

ii. The results relate only to the items tested.

iii. This test report should not be reproduced except in full, without written approval of this laboratory.

iv. Any query regarding the report must be reported immediately.

For Mecadez Core Technologies Private Limited

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Mecadez Core Technologies Private Limited MECADEZ

Test Report
Stability of Mix

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	1
Date	13-Jun-2018

Description	Unit	Test 1	Requirements as per MORT&H
Marshal Stability	KN	9.6	9 KN (min)
Marshal Flow	mm	3.52	2 – 4 mm
Percent of Air Voids in mix	%	4.3	3 – 6 %
Percent of Voids in Mineral Aggregates filled with Bitumen	%	72	65 – 75 %
Density	g/cc	2.22	2.22 g/cc

Note:
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Test Report
Stability of Mix

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	2
Date	14-Jun-2018

Description	Unit	Test 1	Requirements as per MORT&H
Marshal Stability	KN	9.6	9 KN (min)
Marshal Flow	mm	3.4	2 – 4 mm
Percent of Air Voids in mix	%	4.7	3 – 6 %
Percent of Voids in Mineral Aggregates filled with Bitumen	%	73	65 – 75 %
Density	g/cc	2.23	2.22 g/cc

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Test Report
Stability of Mix

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	3
Date	13-Jun-2018

Sl No.	Description	Unit	Test 1	Requirements as per MORT&H
1	Marshal Stability	KN	9.3	9 KN (min)
2	Marshal Flow	mm	3.43	2 – 4 mm
3	Percent of Air Voids in mix	%	4.6	3 – 6 %
4	Percent of Voids in Mineral Aggregates filled with Bitumen	%	75	65 – 75 %
5	Density	g/cc	2.22	2.22 g/cc

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Test Report
Stability of Mix

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	4
Date	14-Jun-2018

Sl. No.	Description	Unit	Test 1	Requirements as per MORT&H
1	Marshal Stability	KN	9.6	9 KN (min)
2	Marshal Flow	mm	3.5	2 – 4 mm
3	Percent of Air Voids in mix	%	4.6	3 – 6 %
4	Percent of Voids in Mineral Aggregates filled with Bitumen	%	71.35	65 – 75 %
5	Density	g/cc	2.23	2.22 g/cc

Note:

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Test Report
Stability of Mix

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	5
Date	14-Jun-2018

Sl.No.	Description	Unit	Test 1	Requirements as per MORT&H
1	Marshal Stability	KN	9.6	9 KN (min)
2	Marshal Flow	mm	3.4	2 – 4 mm
3	Percent of Air Voids in mix	%	4.85	3 – 6 %
4	Percent of Voids in Mineral Aggregates filled with Bitumen	%	70.1	65 – 75 %
5	Density	g/cc	2.21	2.22 g/cc

Note:
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Test Report
Stability of Mix

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	6
Date	14-Jun-2018

Sl.No.	Description	Unit	Test 1	Requirements as per MORT&H
1	Marshal Stability	KN	9.8	9 KN (min)
2	Marshal Flow	mm	3.2	2 – 4 mm
3	Percent of Air Voids in mix	%	4.45	3 – 6 %
4	Percent of Voids in Mineral Aggregates filled with Bitumen	%	71.5	65 – 75 %
5	Density	g/cc	2.22	2.22 g/cc

Note:
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Test Report
Binder Content and Mix Gradation

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	1
Date	13-Jun-2018

	Description	Unit	Computation	Test Result
1	Weight of Empty bowl before Extraction (E)	gm	Eb	1080
2	Weight of bowl + Sample before extraction (w_s)	gm	w_{sb}	1690
3	Weight of Sample taken for the test (S_b)	gm	$S_b = w_{sb} - Eb$	610
4	Weight of bowl + Sample after extraction (w_s)	gm	w_{sa}	1653
5	Weight of Sample after extraction (i.e. washed aggregates) (S_a)	gm	$S_a = w_{sa} - Eb$	573
6	Weight of Filter paper before extraction (F_b)	gm	F_b	2
7	Weight of Filter paper after extraction (F_a)	gm	F_a	4
8	Weight of filler on filter paper (F_d)	gm	$F_d = F_b - F_a$	2
9	Weight of Bitumen without considering Filter paper (W_b)	gm	W_b	37
10	Weight of the Bitumen with considering Filter paper (W_a)	gm	$W_a = w_b - F_d$	35
11	Percentage of the Bitumen (i.e. Binder Content) ($\%_B$)	(%)	$W_a / SbX100$	5.74

I.S. Sieve size (mm)	Weight Retained (gm)	Percentage of weight Retained (%)	Cumulative Percentage of weight retained (%)	Cumulative % of Passing		Remarks
				Test Result	Gradation Limits as per MORT&H	
19.00	0.00	0.00	0.00	100.00	100.00	Gradation satisfies the MORT&H Grade II Specification for Bituminous Concrete
13.20	674.00	16.85	16.85	83.15	72-100	
9.50	432.00	10.80	27.65	72.35	70-88	
4.75	236.00	5.90	33.55	66.45	53-71	
2.36	477.00	11.93	45.48	54.53	42-58	
1.18	340.00	8.50	53.98	46.03	34-48	
0.60	438.00	10.95	64.93	35.08	26-38	
0.30	430.00	10.75	75.68	24.33	18-28	
0.15	378.00	9.45	85.13	14.88	12-20)	
0.08	360.00	9.00	94.13	5.88	(4-10)	

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Test Report
Binder Content and Mix Gradation

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	2
Date	14-Jun-2018

Sl. No.	Description	Unit	Computation	Test Result
1	Weight of Empty bowl before Extraction (E)	gm	Eb	1080
2	Weight of bowl + Sample before extraction (w_s)	gm	w_{sb}	1767
3	Weight of Sample taken for the test (S_b)	gm	$S_b = w_{sb} - Eb$	687
4	Weight of bowl + Sample after extraction (w_s)	gm	w_{sa}	1725
5	Weight of Sample after extraction (i.e. washed aggregates) (S_a)	gm	$S_a = w_{sa} - Eb$	645
6	Weight of Filter paper before extraction (F_b)	gm	F_b	2
7	Weight of Filter paper after extraction (F_a)	gm	F_a	4
8	Weight of filler on filter paper (F_d)	gm	$F_d = F_b - F_a$	2
9	Weight of Bitumen without considering Filter paper (W_b)	gm	W_b	42
10	Weight of the Bitumen with considering Filter paper (W_a)	gm	$W_a = w_b - F_d$	40
11	Percentage of the Bitumen (i.e. Binder Content) ($\%_B$)	(%)	W_a/ SbX100	5.82

Sl. No.	I.S. Sieve size (mm)	Weight Retained (gm)	Percentage of weight Retained (%)	Cumulative Percentage of weight retained (%)	Cumulative % of Passing		Remarks
					Test Result	Gradation Limits as per MORT&H	
1	19.00	0.00	0.00	0.00	100.00	100.00	Gradation satisfies the MORT&H Grade II Specification for Bituminous Concrete
2	13.20	674.00	16.85	16.85	83.15	72-100	
3	9.50	432.00	10.80	27.65	72.35	70-88	
4	4.75	236.00	5.90	33.55	66.45	53-71	
5	2.36	477.00	11.93	45.48	54.53	42-58	
6	1.18	340.00	8.50	53.98	46.03	34-48	
7	0.60	438.00	10.95	64.93	35.08	26-38	
8	0.30	430.00	10.75	75.68	24.33	18-28	
9	0.15	378.00	9.45	85.13	14.88	12-20)	
10	0.08	360.00	9.00	94.13	5.88	(4-10)	

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Test Report

Binder Content and Mix Gradation

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	3
Date	14-Jun-2018

Sl. No.	Description	Unit	Computation	Test Result
1	Weight of Empty bowl before Extraction (E)	gm	Eb	1080
2	Weight of bowl + Sample before extraction (w_s)	gm	w_{sb}	1751
3	Weight of Sample taken for the test (S_b)	gm	$S_b = w_{sb} - Eb$	671
4	Weight of bowl + Sample after extraction (w_s)	gm	w_{sa}	1710
5	Weight of Sample after extraction (i.e. washed aggregates) (S_a)	gm	$S_a = w_{sa} - Eb$	630
6	Weight of Filter paper before extraction (F_b)	gm	F_b	2
7	Weight of Filter paper after extraction (F_a)	gm	F_a	4
8	Weight of filler on filter paper (F_d)	gm	$F_d = F_b - F_a$	2
9	Weight of Bitumen without considering Filter paper (W_b)	gm	W_b	41
10	Weight of the Bitumen with considering Filter paper (W_a)	gm	$W_a = w_b - F_d$	39
11	Percentage of the Bitumen (i.e. Binder Content) ($\%_B$)	(%)	W_a/ SbX100	5.81

Sl. No.	I.S. Sieve size (mm)	Weight Retained (gm)	Percentage of weight Retained (%)	Cumulative Percentage of weight retained (%)	Cumulative % of Passing		Remarks
					Test Result	Gradation Limits as per MORT&H	
1	19.00	0.00	0.00	0.00	100.00	100.00	Gradation satisfies the MORT&H Grade II Specification for Bituminous Concrete
2	13.20	690.00	17.25	17.25	82.75	72-100	
3	9.50	405.00	10.13	27.38	72.63	70-88	
4	4.75	225.00	5.63	33.00	67.00	53-71	
5	2.36	470.00	11.75	44.75	55.25	42-58	
6	1.18	300.00	7.50	52.25	47.75	34-48	
7	0.60	400.00	10.00	62.25	37.75	26-38	
8	0.30	450.00	11.25	73.50	26.50	18-28	
9	0.15	365.00	9.13	82.63	17.38	12-20)	
10	0.08	470.00	11.75	94.38	5.63	(4-10)	

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Test Report
Binder Content and Mix Gradation

Project Name	Improvements to roads and drains at Kogilu Layout at Ward No.05.
Client	Road Infrastructure, Project Division Yalahanka
Job No	MCTPL/BBMP/Project YNK/PMC/2017-2018/QR/04
Mix Type	Bituminous Concrete (BC)
Contractor	M/s KRIDL
Test Method	Specification for Road & Bridge Works, MORT&H, Revision V.
Location	Bay
Material	Bituminous Concrete mix
Sample No	4
Date	14-Jun-2018

Sl. No.	Description	Unit	Computation	Test Result
1	Weight of Empty bowl before Extraction (E)	gm	Eb	1080
2	Weight of bowl + Sample before extraction (w_s)	gm	w_{sb}	715
3	Weight of Sample taken for the test (S_b)	gm	$S_b = w_{sb} - Eb$	718
4	Weight of bowl + Sample after extraction (w_s)	gm	w_{sa}	670
5	Weight of Sample after extraction (i.e. washed aggregates) (S_a)	gm	$S_a = w_{sa} - Eb$	-410
6	Weight of Filter paper before extraction (F_b)	gm	F_b	2
7	Weight of Filter paper after extraction (F_a)	gm	F_a	4
8	Weight of filler on filter paper (F_d)	gm	$F_d = F_b - F_a$	2
9	Weight of Bitumen without considering Filter paper (W_b)	gm	W_b	45
10	Weight of the Bitumen with considering Filter paper (W_a)	gm	$W_a = w_b - F_d$	43
11	Percentage of the Bitumen (i.e. Binder Content) ($\%_b$)	(%)	$W_a / SbX100$	5.99

Sl. No.	I.S. Sieve size (mm)	Weight Retained (gm)	Percentage of weight Retained (%)	Cumulative Percentage of weight retained (%)	Cumulative % of Passing		Remarks
					Test Result	Gradation Limits as per MORT&H	
1	19.00	0.00	0.00	0.00	100.00	100.00	Gradation satisfies the MORT&H Grade II Specification for Bituminous Concrete
2	13.20	667.00	16.68	16.68	83.33	72-100	
3	9.50	416.00	10.40	27.08	72.93	70-88	
4	4.75	233.00	5.83	32.90	67.10	53-71	
5	2.36	490.00	12.25	45.15	54.85	42-58	
6	1.18	314.00	7.85	53.00	47.00	34-48	
7	0.60	419.00	10.48	63.48	36.53	26-38	
8	0.30	382.00	9.55	73.03	26.98	18-28	
9	0.15	380.00	9.50	82.53	17.48	12-20)	
10	0.08	370.00	9.25	91.78	8.22	(4-10)	

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